

**High School Motivation and Engagement:  
Gender and Age Effects**

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Running Head: Gender, Age, Motivation, Engagement

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**Abstract**

This brief report presents on gender and age effects in academic motivation and engagement. The results are based on an updated and much expanded dataset (from prior research) of 33,778 students from 92 high schools in Australia. Findings show there are significant gender and age effects – a number of which are qualified by the interaction of gender and age. For the most part, females are higher in motivation and engagement than males and 12-13 year olds are more motivated and engaged than 14-15 year olds and 16-18 year olds. In terms of interaction effects, although males and females decline in motivation and engagement between 12-13 years and 14-15 years, females' motivation and engagement tends to increase in later adolescence (16-18 years) whereas males' motivation and engagement does not (or not to the same extent). Findings hold implications for practitioners and researchers seeking to better understand and address motivation and engagement relevant to males and females across adolescence.

**Introduction**

Motivation can be conceptualized as students' inclination, energy and drive to learn, work effectively, and achieve to potential. Engagement can be conceptualized as the strategies associated with this inclination, energy, and drive (Martin, 2012). Motivation and engagement play an important part in students' interest in and enjoyment of school and study. Motivation and engagement can also underpin students' achievement (Liem & Martin, 2012; Martin, 2007, 2009; Martin, Marsh, & Debus, 2001a, 2001b; 2003; Pintrich, 2003; Schunk, 1990). This brief report explores gender and age effects in a large-scale motivation and engagement dataset.

Prior research suggests that girls outperform boys in a number of academic areas (Collins, Kenway, & McLeod, 2000); suspension rates are higher for boys than girls (Ainley & Lonsdale, 2000); and teachers report that boys are less able to concentrate, less determined to solve problems, and less productive (MacDonald, Saunders, & Benfield, 1999; Rowe & Rowe, 1999). Alongside gender, research has identified age differences in motivation and engagement. The transition from elementary to middle school is challenging (Roeser, Eccles, & Sameroff, 2000) and a decline in motivation and engagement has been found after this transition (Wigfield & Tonks, 2002).

These patterns of findings have led to calls for more research to investigate gender and age effects in the classroom. Prior research has explored comparative motivation and engagement profiles for girls and boys and across age groups. In analyses of over 12,000 responses to the Motivation and Engagement Scale – High School (MES-HS; Martin, 2008), girls were found to be significantly higher than boys in valuing of school, mastery orientation, planning, task management, and persistence. Boys were significantly higher than girls in self-handicapping and disengagement. Interestingly, however, girls reported higher anxiety than boys (Martin, 2007, 2009; see Liem & Martin, 2012 for a review). In terms of age, middle high school students (14-15 years) were generally found to be less motivated and engaged than high school students younger and older than them.

The present brief report revisits prior work by Martin and colleagues with a much larger sample of over 33,000 high school students from 92 schools. It is, therefore, a substantial update on prior work into this area. Consistent with this work, it does so using the Motivation and Engagement Scale – High School (MES-HS; Martin, 2008) that comprises four higher-order factors constituting: adaptive cognition (a positive cognitive orientation to learning); adaptive behavior (positive strategies individuals use to engage in their learning); impeding cognition (a cognitive orientation that inhibits motivated engagement in learning); and maladaptive behavior (detrimental strategies that individuals engage in approaching their learning) (Liem & Martin, 2012). Eleven motivation and engagement factors underpin each of these higher order groupings. Self-efficacy, valuing, and mastery orientation reflect adaptive cognition. Planning, task management, and

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persistence reflect adaptive behavior. Anxiety, failure avoidance, and uncertain control reflect impeding cognition. Self-handicapping and disengagement reflect maladaptive behavior.

### **Method**

#### **Sample and Procedure**

Findings are based on a sample of 33,778 high school students from 92 Australian schools (48 government/systemic and 44 independent schools; 63 co-educational, 15 single-sex girls, 14 single-sex boys schools). Students were aged 12-13 years (32%), 14-15 years (39%), and 16-18 years (29%). The mean age of students was 14.43 (SD=1.57) years. In total, 55% of students were males and 45% females. A total of 15% of students were from a non-English speaking background. For the most part, teachers administered the MES to students during class. The rating scale was first explained and a sample item presented. Students were then asked to complete the MES on their own and to return the completed instrument to the teacher at the end of class.

#### **Materials**

Each of the eleven MES subscales comprises four items – hence the MES is a 44-item instrument. To respond to the MES, a 7-point Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree) is provided. For psychometric properties of the MES – including reliability, factor structure, invariance as a function of key sub-groups (e.g., gender), and relationships with academic outcomes, see Martin (2007, 2009). The following scale descriptions are from Martin (2007, 2009).

##### **Adaptive cognition**

*Self-efficacy* (e.g., “If I try hard, I believe I can do my schoolwork well”): Self-efficacy is students’ belief and confidence in their ability to understand or to do well in their schoolwork, to meet challenges they face, and to perform to the best of their ability.

*Valuing school* (e.g., “Learning at school is important”): Valuing (school) is how much students believe what they learn at school is useful, important, and relevant to them or to the world in general.

*Mastery orientation* (e.g., “I feel very pleased with myself when I really understand what I’m taught at school”): Mastery orientation entails being focused on learning, solving problems, and developing skills.

##### **Adaptive behavior**

*Planning* (e.g., “Before I start an assignment I plan out how I am going to do it”): Planning is how much students plan their schoolwork, assignments, and study and how much they keep track of their progress as they are doing them.

*Task (study) management* (e.g., “When I study, I usually study in places where I can concentrate”): Task (study) management refers to the way students use their study time, organize their study timetable, and choose and arrange where they study.

*Persistence* (e.g., “If I can’t understand my schoolwork at first, I keep going over it until I do”): Persistence is how much students keep trying to work out an answer or to understand a problem even when that problem is difficult or is challenging.

##### **Impeding cognition**

*Anxiety* (e.g., “When exams and assignments are coming up, I worry a lot”): Anxiety has two parts: feeling nervous and worrying. Feeling nervous is the uneasy or unpleasant feeling students have when they think about their schoolwork, assignments, or exams. Worrying is their fear of not doing very well in their schoolwork, assignments, or exams.

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*Failure avoidance* (e.g., “Often the main reason I work at school is because I don’t want to disappoint my parents”): Students have an avoidance focus when the main reason they do their schoolwork is to avoid doing poorly or to avoid being seen to do poorly.

*Uncertain control* (e.g., “I’m often unsure how I can avoid doing poorly at school”): Uncertain control assesses students’ uncertainty about how to do well or how to avoid doing poorly.

### **Maladaptive behavior**

*Self-handicapping* (e.g., “I sometimes don’t study very hard before exams so I have an excuse if I don’t do so well”): Students self-handicap when they do things that reduce their chances of success at school. Examples are putting off doing an assignment or wasting time while they are meant to be doing their schoolwork or studying for an exam.

*Disengagement* (e.g., “I’ve pretty much given up being involved in things at school”): Students are disengaged or at risk of disengagement when they feel like giving up in particular school subjects or in school generally. Students high in disengagement tend to accept failure and behave in ways that reflect helplessness.

## **Data Analysis**

Scale scores were developed by finding the mean of the set of items for each factor and then converting these to a score out of 100 (/100). Data were analyzed using IBM SPSS version 20. To test for differences between boys and girls as a function of age group, a 2 (female, male) x 3 (12-13 years, 14-15 years, 16-18 years) MANOVA on the eleven motivation and engagement factors was conducted. Given the large sample and the multiple dependent measures, a conservative p-value of .001 was set. There were 2.5% missing data, which were imputed using the EM Algorithm. Results are presented in Table 1.

## **Results**

The main effect of gender is significant ( $p < .001$ ) for all motivation factors except self-belief and failure avoidance. Females are significantly higher than males on valuing school, mastery orientation, planning, task management, and persistence – and significantly lower than males on self-handicapping and disengagement. However, females are also significantly higher than males on anxiety and uncertain control. There is a significant ( $p < .001$ ) main effect for age group on all factors except uncertain control. For the most part, 12-13 year-old students score higher than 14-15 and 16-18 year olds on all adaptive motivation and engagement factors – and lower on impeding and maladaptive motivation and engagement factors.

On five of the eleven factors, main effects were qualified by significant ( $p < .001$ ) interaction effects. For valuing school, mastery orientation and task management, males and females decline from 12-13 years to 14-15 years – however at 16-18 years, females’ decline ceases or reverses whereas males’ decline tends to continue. For anxiety, females’ anxiety increases at a sharper rate from 12-13 years through to 14-15 years and then to 16-18 years; males’ anxiety increases at a less sharper rate across high school. For disengagement, females’ and males’ disengagement increases from 12-13 years to 14-15 years, however females’ disengagement declines at 16-18 years whereas males’ disengagement continues to increase during this time.

## **Summary and Conclusion**

The present findings provide a substantial update (in terms of student and school numbers) on prior research into gender and age effects relevant to motivation and engagement. Based on a large sample of 33,778 students from 92 high schools, there are significant gender, age, and gender x age effects on key facets of motivation and engagement. Although females are generally more motivated than males, there are some dimensions on which they do not perform so positively (anxiety, uncertain control). In general, motivation and engagement come under most pressure during middle and later adolescence. Importantly, however, on a number of adaptive, impeding and

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maladaptive factors, age effects are qualified by gender such that different profiles emerge for males and females at different stages of adolescent development. Taken together, these findings hold implications for practitioners seeking to address boys' and girls' motivational pathways through adolescence and for researchers seeking to understand gender and age factors relevant to motivation and engagement.

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Table 1. Means (/100) and SDs for each of the 11 Motivation and Engagement Scale (MES) factors

	<b>Sample Mean (SD)</b>	<b>Females Mean (SD)</b>	<b>Males Mean (SD)</b>	<b>12-13 years Mean (SD)</b>	<b>14-15 years Mean (SD)</b>	<b>16-18 years Mean (SD)</b>	<b>Gender x Age Interaction (p&lt;.001)</b>
<b>Adaptive cognition</b>							
Self-efficacy	81 (14)	81 (14)	81 (15)	82 (14)	80 (15)	80 (14)*	-
Valuing school	81 (14)	82 (14)	81 (15)*	85 (14)	80 (15)	79 (14)*	<.001 (see text)
Mastery orientation	83 (14)	84 (13)	81 (15)*	84 (14)	82 (14)	82 (13)*	<.001 (see text)
<b>Adaptive behavior</b>							
Planning	61 (18)	62 (18)	60 (18)*	64 (18)	59 (18)	60 (17)*	-
Task management	70 (18)	72 (18)	69 (19)*	72 (19)	68 (18)	70 (18)*	<.001 (see text)
Persistence	70 (16)	71 (16)	69 (16)*	73 (16)	69 (16)	69 (16)*	-
<b>Impeding cognition</b>							
Anxiety	61 (20)	65 (19)	58 (19)*	58 (20)	61 (19)	63 (19)*	<.001 (see text)
Failure avoidance	46 (20)	46 (20)	46 (20)	45 (21)	47 (19)	46 (19)*	-
Uncertain control	49 (19)	50 (18)	49 (19)*	49 (19)	49 (18)	49 (18)	-
<b>Maladaptive behavior</b>							
Self-handicapping	39 (19)	39 (18)	40 (19)*	38 (18)	40 (19)	40 (18)*	-
Disengagement	35 (17)	34 (17)	35 (18)*	31 (16)	36 (17)	38 (18)*	<.001 (see text)

\*p < .001

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